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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/630,465 | 07/30/2003 | Kiran R. Desai | INTEL/16347 | 9175 |

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EXAMINER

BARTON, JONATHAN A

ART UNIT PAPER NUMBER

2186

DATE MAILED: 05/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/630,465 | Applicant(s) DESAI, KIRAN R. | |
| | Examiner Jonathan Barton | Art Unit 2186 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-44 is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This office action is in response to the amendment filed by Applicant on 2/23/2006.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Albonesi et al. (US 5,113,514) in view of Anonymous Disclosure (IPCOM000010890D).

a. As for claims 1 and 8 Albonesi discloses

- i. Determining a cache line state, the cache line state being associated with [] a cache line in a second cache (Col. 10 Lines 27-30);
and
- ii. Posting a hit-modified signal if the cache line state is an enhanced exclusive state (Col. 9 Lines 14-18),
- iii. Wherein the enhanced exclusive state indicates a copy of the cache line is in the first cache in a modified state (Col. 9 Lines 7-13, Col. 8 Lines 24-33)
- iv. And the cache line in the second cache is unmodified (Col. 8 Lines 24-33).

b. Albonesi fails to disclose

- v. The cache line state being associated with the external cache snoop probe.
 - vi. Anonymous Disclosure teaches this (Par. 7 Lines 3-5).
 - vii. It would have been obvious to one of ordinary skill in the art at the time of the invention to have combined the snoop probe taught by the Anonymous Disclosure with the cache coherence method of Albonesi because both systems are cache coherence systems based in a MESI type coherence method and the snoop probe provides improved functionality, improved cache performance and improved overall performance (Anonymous Disclosure Par. 6 Lines 2-5).
- c. As for claims 2 and 9 Albonesi discloses
- viii. Posting the hit-modified signal if the cache line state is an enhanced modified state, wherein the enhanced modified state indicates a copy of the cache line may be in the first cache (Col. 9 Lines 14-18, Col. 9 Lines 4-7).
- d. As for claim 3 and 10 Albonesi discloses
- ix. Posting the hit-modified signal if the cache line state is a modified state, wherein the modified state indicates the second cache owns the cache line and the first cache does not own the cache line (Col. 8 Lines 24-33).
- e. As for claims 4 and 11 the Anonymous Disclosure teaches

- x. Sending a snoop-to-invalidate probe to the first cache after posting the hit-modified signal (Par. 7 Line 10).
- f. As for claims 5 and 12 the Anonymous Disclosure teaches
 - xi. The external cache snoop probe is sent to the second cache, a second cache write-back queue, and an intermediate structure between the first cache and the second cache (Par. 7 Lines 3-5).
- g. As for claims 6 and 13 the Anonymous Disclosure teaches
 - xii. The external cache snoop probe is sent only to the second cache, a second cache write-back queue, and an intermediate structure between the first cache and the second cache (Par. 7 Lines 3-6)
- h. As for claim 7 the Anonymous Disclosure teaches
 - xiii. Determining a snoop type associated with the external cache snoop probe is one of a snoop-to-share type and a snoop-to-invalidate type (Par. 7 Line 10 – Par. 8 Line 2).

Allowable Subject Matter

- 3. Claims 14-44 are allowed.

Response to Arguments

- 4. Applicant's arguments filed 2/23/2006 have been fully considered but they are not persuasive.

xiv. With regard to claims 1 and 8 Applicant alleges that the “modified state” disclosed by Albonesi is not the same as Applicant’s “enhanced exclusive state” *because the two cache states result in different outputs for at least some sets of input conditions and, thus, represent technically different states*. Applicant provides only one scenario where this is true. In this scenario *the cache line in the first and second caches are both in a “modified state”*. Applicant alleges that this would results in Albonesi’s system would result in a “modified cache state” while Applicant’s own system would not result in it’s “enhanced exclusive state”. Examiner disagrees with this scenario. Referring to Col. 8 Lines 24-33, Albonesi discloses that the exact situation claimed in claims 1 and 8 (specifically: *the cache line is in the first cache in a modified state, and the cache line in the second cache is unmodified*) is what results in a “modified state”.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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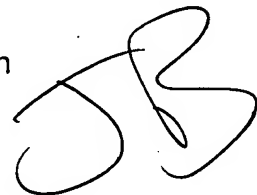
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Barton whose telephone number is 571-272-8157. The examiner can normally be reached on Monday - Friday 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonathan Barton
Examiner
Art Unit 2186



JB



MATTHEW KIM
SUPERVISORY PATENT EXAMINER
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